DMEA
SBIR 16.2 PROPOSAL SUBMISSION INSTRUCTIONS

INTRODUCTION

The Defense Microelectronics Activity (DMEA) SBIR/STTR Program is implemented, administrated, and managed by the DMEA Management Operations and Support Division. If you have any questions regarding the administration of the DMEA SBIR/STTR Program, please contact the DMEA SBIR/STTR Program Manager (PM), Mr. Gene Graham, gene.graham@dmea.osd.mil.

For general inquiries or problems with electronic submission, contact the DoD SBIR/STTR Help Desk at 1-800-348-0787 between 9:00 am to 6:00 pm ET. For questions about the topic during the pre-solicitation period (22 April 2016 through 22 May 2016), contact the Topic Authors listed under each topic on the https://sbir.defensebusiness.org/ website prior to the Open phase of the solicitation. Information regarding the DMEA mission and programs can be found at http://www.dmea.osd.mil.

DISCRETIONARY TECHNICAL ASSISTANCE

DMEA may provide up to $5,000 of SBIR funds for the Discretionary Technical Assistance (DTA) described per year for each Phase I award and each Phase II award as outlined in Section 4.22 of the program solicitation. Due to limited funding, DMEA reserves the right to approve or disapprove any DTA requests. DTA requests must be included in the Explanatory Material section of the firm's cost proposal specifically identified as "Discretionary Technical Assistance."

PHASE I GUIDELINES

DMEA intends for Phase I to be only an examination of the merit of the concept or technology that still involves technical risk, with a cost not exceeding $150,000.

A list of the topics currently eligible for proposal submission is included in this section followed by full topic descriptions. These are the only topics for which proposals will be accepted at this time. The topics are directly linked to DMEA's core research and development requirements.

Please ensure that your e-mail address listed in your proposal is current and accurate. DMEA cannot be responsible for notification to companies that change their mailing address, e-mail address, or company official after proposal submission.

PHASE I PROPOSAL SUBMISSION

Read the DoD front section of this solicitation for detailed instructions on proposal format and program requirements. When you prepare your proposal submission, keep in mind that Phase I should address the feasibility of a solution to the topic. Only UNCLASSIFIED proposals will be entertained.

The technical period of performance for the Phase I should be no more than six (6) months. DMEA will evaluate and select Phase I proposals using the evaluation criteria contained in Section 6.0 of the DoD Solicitation 16.2 Preface Instructions. Due to limited funding, DMEA reserves the right to limit awards under any topic, and only proposals considered to be of superior quality will be funded.

DMEA accepts Phase I proposals not exceeding $150,000. DMEA will conduct a price analysis to determine whether cost proposals, including quantities and prices, are fair and reasonable. Contractors should expect that cost proposals will be negotiated.

If you plan to employ NON-U.S. citizens in the performance of a DMEA SBIR contract, please identify these individuals in your proposal as specified in Section 5.4.c(8) of the program solicitation.

It is mandatory that the ENTIRE Technical Volume, DoD Proposal Cover Sheet, Cost Volume and the Company Commercialization Report are submitted electronically through the DoD SBIR website at https://sbir.defensebusiness.org/. The DoD proposal submission site submission will lead you through the process for submitting your technical proposal and all of the sections electronically. Each of these documents is submitted separately through the website. If you have any questions or problems with the electronic proposal submission, contact the DoD SBIR/STTR Help Desk at 1-800-348-0787.

Your proposal submission must be submitted via the submission site on or before the 6:00 a.m. ET deadline on 22 June 2016.

Proposal submissions that are not complete or that are received after the closing date and time will not be considered for award.

PHASE II GUIDELINES

Phase II is the prototype/demonstration of the technology that was found feasible in Phase I. DMEA encourages, but does not require, partnership and outside investment as part of discussions with DMEA sponsors for potential Phase II efforts.

Phase II proposals may be submitted for an amount not to exceed $1,000,000.

PHASE II PROPOSAL SUBMISSION

The Reauthorization of the SBIR/STTR Program has resulted in significant changes to the Phase II proposal submission process. On December 31, 2011, the President of the United States signed into law the National Defense Authorization Act for Fiscal Year 2012 (Defense Reauthorization Act), Public Law 112–81. Section 5001, Division E, of the Defense Reauthorization Act contains the SBIR/STTR Reauthorization Act of 2011 (SBIR/STTR Reauthorization Act), which extends both the SBIR and STTR Programs through September 30, 2017.

Phase I awardees may submit a Phase II proposal without invitation not later than sixty (60) calendar days following the end of the Phase I contract. The Phase II proposal submission instructions are identified in the Phase I contract, Part I – The Schedule, Section H, Special contract requirements, "H-959 SBIR Phase II Proposal Submission Instructions."

All Phase II proposals must have a complete electronic submission. Complete electronic submission includes the submission of Cover Sheet, Cost Volume, Company Commercialization Report, the entire Technical Volume, and any appendices via the DoD submission site (https://sbir.defensebusiness.org/). The DoD proposal submission site will lead you through the process for submitting your technical volume and all of the sections electronically. Each of these documents is submitted separately through the website. Your proposal must be submitted via the submission site on or before the DMEA-specified deadline or it will not be considered for award.

DMEA will evaluate Phase II proposals based on the Phase II evaluation criteria listed in Section 8.0 of DoD Solicitation 16.2 Preface. DMEA does not have an established page limit for Phase II submissions. Please reference the DoD SBIR Submission site FAQs for more information on generating Phase II proposals. Due to limited funding, DMEA's ability to award any Phase II, regardless of proposal quality or merit, is subject to availability of funds. Please ensure that your proposal is valid for 120 days after submission, and any extension to that time period will be requested by the contracting officer.

Any follow-on Phase II proposal (i.e., a second Phase II subsequent to the initial Phase II effort) shall be initiated by the Government Technical Point of Contact for the initial Phase II effort and must be approved by the DMEA SBIR/STTR Program Manager in advance.

COST VOLUME GUIDELINES

The on-line cost volume for Phase I and Phase II proposal submissions must be at a level of detail that would enable DMEA personnel to determine the purpose, necessity, and reasonability of each cost element. Provide sufficient information (a through i below) on how funds will be used if the contract is awarded. Include the itemized cost volume information (a through i below) as an appendix in your technical proposal. The itemized cost volume information (a through i below) will not count against the 20-page limit.

a. Special Tooling and Test Equipment and Material: The inclusion of equipment and materials will be carefully reviewed relative to need and appropriateness of the work proposed. The purchase of special tooling and test equipment must, in the opinion of the Contracting Officer, be advantageous to the government and relate directly to the specific effort. They may include such items as innovative instrumentation and/or automatic test equipment. Title to property furnished by the Government or acquired with Government funds will be vested with the DoD Component; unless it is determined that transfer of the title to the contractor would be more cost effective than recovery of the equipment by the DoD Component.
b. Direct Cost Materials: Justify costs for materials, parts, and supplies with an itemized list containing types, quantities, price, and where appropriate, purposes.
c. Other Direct Costs: This category of costs includes specialized services such as machining or milling, special testing or analysis, costs incurred in obtaining temporary use of specialized equipment. Proposals, which include teased hardware, must provide an adequate lease *versus* purchase justification or rationale.
d. Direct Labor: Identify key personnel by name if possible or by labor category if specific names are not available. The number of hours, labor overhead and/or fringe benefits and actual hourly rates for each individual are also necessary.
e. Travel: Travel costs must relate to the needs of the project. Break out travel cost by trip, with the number of travelers, airfare, and per diem. Indicate the destination, duration, and purpose of each trip.
f. Cost Sharing: Cost sharing is permitted. However, cost sharing is not required, nor will it be an evaluation factor in the consideration of a proposal.
g. Subcontracts: Involvement of university or other consultants in the planning and /or research stages of the project may be appropriate. If the offeror intends such involvement, describe the involvement in detail and include information in the cost proposal. The proposed total of all consultant fees, facility leases, or usage fees and other subcontract or purchase agreements may not exceed one-third of the total contract price or cost, unless otherwise approved in writing by the Contracting Officer. Support subcontract costs with copies of the subcontract agreements. The supporting agreement documents must adequately describe the work to be performed (i.e., Cost Volume). At the very least, a statement of work with a corresponding detailed cost volume for each planned subcontract must be provided.

h. Consultants: Provide a separate agreement letter for each consultant. The letter should briefly state what service or assistance will be provided, the number of hours required, and the hourly rate.

DMEA SBIR PHASE II ENHANCEMENT PROGRAM

To encourage transition of SBIR into DoD systems, DMEA has a Phase II Enhancement policy. DMEA's Phase II Enhancement program requirements include: up to one-year extension of existing Phase II, and up to $500,000 matching SBIR funds. Applications are subject to review of the statement of work, the transition plan, and the availability of funding. DMEA will generally provide the additional Phase II Enhancement funds by modifying the Phase II contract.

PHASE I PROPOSAL SUBMISSION CHECKLIST:

All of the following criteria must be met or your proposal will be REJECTED.

_____1. Your Technical Volume, the DoD Cover Sheet, the DoD Company Commercialization Report (required even if your firm has no prior SBIRs), and the Cost Volume have been submitted electronically through the DoD submission site by 6:00 am ET on 22 June 2016.

_____2. The Phase I proposal does not exceed $150,000.

DMEA SBIR 16.2 Topic Index

DMEA SBIR 16.2 Topic Descriptions

DMEA162-001 TITLE: High-brilliance 9keV X-ray Source

TECHNOLOGY AREA(S): Electronics, Sensors

OBJECTIVE: Develop a high-flux 9keV x-ray source with a spot size larger than 10um

DESCRIPTION: Rapid Integrated Circuit (IC) inspection has become a high priority. X-ray inspection of large volumes of an IC is limited to the high intensity beams at a synchrotron. However, those facilities are not easily accessible for routine inspection of parts. Table-top x-ray sources output, at best, 109 x-ray photons/sec(mrad2)mm2(0.1%BW) at 9keV. This limits the quality of the images and the throughput. Mini-synchrotron-like inverse Compton scattering sources may achieve these fluxes, but they are much larger and more complicated to operate. A high-brilliance 9keV x-ray source is needed to quickly image the small features of modern ICs in an x-ray microscope.

PHASE I: Perform a study and provide the preliminary design of an innovative x-ray source. Identify new pathways on how to achieve an x-ray source with the following characteristics:

1) X-ray peak energy between 9 and 11keV (above Cu K lines)
2) Brightness of 1x1011 photons/sec(mrad2)mm2(0.1%BW)) or higher
3) Spot size between 10um and 40um
4) Foot print smaller than 40cm x 40cm x 60cm (not including power supply and chiller)
5) Unstructured spot with a Gaussian profile
6) If pulsed, less than 1% variation in total intensity and in spatial profile from shot to shot

The design and detailed specs need to be provided not only for the x-ray source but also for the power supply, chiller (no larger than 10ft3), and any other equipment necessary to operate the source. An interlock that allows a temporary pause in the projection of x-rays without a long (at most 1 minute) re-start time needs to also be designed.

Deliver a report of research and innovation that presents tradeoffs between the new approach and existing technology. If any of the above constraints cannot be adhered to, the report must include relevant research and rationale. Offerors may provide alternative parameters that are both attainable and consistent with the goals summarized above. The report must also include all generated files (e.g., CAD drawings) and a program plan for source development.

PHASE II: Based on the aforementioned research, and applicable development/innovation, build the designed prototype. Test and deliver the prototype, characterization results, all generated files (e.g., final CAD drawings, test results), operation instructions, and the test plan to the Government for further testing and verification.

PHASE III DUAL USE APPLICATIONS: There may be opportunities for further development of this source for use in a specific military or commercial application. During a Phase III program, offerors may refine the performance of the design and produce pre-production quantities for evaluation by the Government.

REFERENCES:
1. O. Hemberg, M. Otendal, and H. M. Hertz (August 2003) Liquid-metal-jet anode electron-impact x-ray source – Applied Physics Letters.

2. Graves, W.S. et al. “MIT inverse Compton source concept.” Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment 608.1 (2009): S103-S105.

3. R&D toward a compact high-brilliance X-ray source based on channeling radiation. Piot, P. and Brau, C. A. and Gabella, W. E. and Choi, B. K. and Jarvis, J. D. and Lewellen, J. W. and Mendenhall, M. H. and Mihalcea, D., AIP

Conference Proceedings, 1507, 734-739 (2012), DOI:http://dx.doi.org/10.1063/1

4. I. Kieffer, P. Gergaud, P. Dova, P. Panine, S. Rodrigues. Development of a High Brilliance X-ray Source For Advanced Thin Film Characterization. 2011 NIST Semiconductor and Dimensional Metrology Division Conference (October 2011).

5. Weisshaupt, Jannick, et al. “High-brightness table-top hard X-ray source driven by sub-100-femtosecond mid-infrared pulses.” Nature Photonics 8.12 (2014): 927-930.

KEYWORDS: X-ray source, Imaging, X-ray flux

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